

<i>(Per ILA Approval Requirements)</i>	
CA	<input type="checkbox"/> Approval
JB	<input checked="" type="checkbox"/> Approval

CONTRACT CHANGE AGREEMENT

This Contract Change Agreement ("Agreement" or "CCA") is entered into by and between ERG Transit Systems (USA) Inc, a California corporation and wholly owned subsidiary of ERG Limited, an Australian corporation (hereinafter referred to as the "Contractor"), and each of the following seven public transportation agencies (hereinafter referred to individually as an "Agency" or collectively as the "Agencies"):

1. Central Puget Sound Regional Transit Authority ("Sound Transit")
2. King County ("King County")
3. Kitsap County Public Transportation Benefit Area ("Kitsap Transit")
4. Pierce County Public Transportation Benefit Area ("Pierce Transit")
5. Snohomish County Public Transportation Benefit Area ("Community Transit")
6. City of Everett ("Everett")
7. State of Washington, acting through the Washington State Department of Transportation, Washington State Ferries Division ("WSF")

RECITALS

- A. Effective April 29, 2003, each of the Agencies and the Contractor entered into Contract #229944 ("Contract") to implement a Regional Fare Coordination System ("RFC System" or "RFCS") to establish a common fare system utilizing smart card technology. The Contractor is responsible for the development, implementation, operation and maintenance of the RFC System as specified in the Contract.
- B. The Parties have executed several Contract Amendments and Change Orders since execution of the original Contract.
- C. Since the inception of the Project the Contractor has been developing successively more detailed design documents in an effort to achieve the Project Milestone of Final Design Completion.
- D. The Agencies have actively participated in the Contractor's design process by reviewing design documents, meeting with the Contractor's representatives and providing detailed information about the Agencies' existing and planned facilities, vehicles, systems, business rules, fare policies and other matters related to the RFCS.

E. The design process has extended beyond the time allocated for design activities in the last-approved Project Schedule ("CO#4 Project Schedule"). Further, upon more detailed planning, it appears that more time than was allocated in said CO#4 Project Schedule will be necessary for the completion of post-design implementation activities.

F. Adding time to create a reasonably achievable Project Schedule through Completion of Final Design, Beta Test Acceptance and Full System Acceptance has and will result in damages and additional costs for both the Contractor and the Agencies.

G. The causes of the delay to-date are varied and subject to disagreement between the Contractor and the Agencies, but all acknowledge that the design process has been more complex and challenging than anticipated.

H. In addition, disagreements between the Contractor and the Agencies have arisen during the design process over interpretations of the Contract requirements, with regard to both design and implementation matters.

I. Disagreements between the Contractor and Agencies have also arisen over what activity durations would constitute a reasonably achievable Project Schedule going forward.

J. Notwithstanding these disagreements, the Contractor has continued to perform design and development activities and the Contractor and the Agencies have continued to work cooperatively in good faith on the design process and the planning for implementation.

K. The Parties have asserted claims and potential claims against each other arising from the delays to the Project Schedule and other Contract issues but, without admitting any liability, desire to compromise and settle their respective claims and potential claims.

L. The Contractor and the Agencies have negotiated and agreed upon the terms and provisions of this Agreement in order to: continue making progress on RFCS design and implementation; establish a new Project Schedule that allows all Parties to effectively plan for future RFCS implementation tasks; resolve issues that could cause further delay to the Project if not resolved; defer resolution of certain design issues as specified in this Agreement; and avoid the uncertainties and inconvenience of litigation and the delays and expenses attendant thereto.

TERMS

NOW, THEREFORE, in consideration of the mutual covenants contained herein, the sufficiency of which is hereby acknowledged, Contractor and the Agencies agree as follows:

1.0 Definitions

1.1 "Damages" means any direct and indirect damages, including but not limited to increased direct and indirect costs, overhead, losses, delayed revenue receipts, loss of use, loss of time, loss of goodwill, inconvenience, commercial loss, lost profits or anticipated business savings, wasted management time or other indirect, incidental or consequential damages.

1.2 "Future Delay(s)" means failure to timely complete a task with a "Finish" date after August 8, 2005, as specified in the New Project Schedule attached to this Agreement.

1.3 “Past Delay(s)” means delay experienced prior to and through August 8, 2005, the date of execution of this Agreement.

1.4 “Schedule Change” means the changes to the Project Schedule that are encompassed in the New Project Schedule attached to this Agreement, including (a) any Past Delays; (b) any changes in the time for the total Project Schedule, each Project and Payment Milestone and/or each listed task or activity; and (c) the past, present and future effects of Past Delays and said changes in the Project Schedule, including but not limited to any impacts, cumulative impacts, ripple effects, use of different means or methods, increased levels of effort, added resources, changed sequences, compressions, accelerations, demobilizations, inefficiencies, disruptions and other effects on the Contractor of same. The term “Schedule Change” does not include Future Delays and the impacts of Future Delays.

2.0 New Project Schedule

2.1 The Agencies and the Contractor hereby agree, without further execution, to amend the Contract as provided in Amendment Twelve to the Contract, a copy of which is attached hereto as “CCA-Attachment A.” Among other things, said Amendment Twelve establishes a New Project Schedule.

2.2 The Contractor, for and on behalf of itself, its parent corporation and their subcontractors, suppliers and any other person or entity supplying work or materials to the RFCS Project through them, forever and unconditionally releases and forever discharges the Agencies, each of them and their respective officials, employees, contractors and agents, from any and all claims, demands, suits, actions, Damages, expenses (including attorneys’ fees and related costs whether or not litigation is commenced) and liabilities of any kind (“Contractor Claims”), known or unknown, that have arisen, or will arise in the future, as a result of the Schedule Change and actual or constructive changes that occurred or began prior to the date of this Agreement. Without limiting the foregoing, this release and discharge shall include Contractor Claims for adjustment of time and compensation asserting that the Schedule Change caused or contributed to Damages. Provided, however, this release and discharge does not apply to Contractor Claims based on the non-delay issues referred to in Section 5.0 or on a Future Delay and the impacts thereof in the performance of the New Project Schedule.

2.3 The Agencies forever and unconditionally release and forever discharge the Contractor, its parent corporation and their officers, employees, suppliers, contractors and agents, from any and all claims, demands, suits, actions, Damages, expenses (including attorneys’ fees and related costs whether or not litigation is commenced) and liabilities of any kind (“Agency Claims”), known or unknown, that have arisen, or will arise in the future, as a result of the Schedule Change. Without limiting the foregoing, this release and discharge shall include Agency Claims asserting that the Schedule Change caused or contributed to Damages. Provided, however, this release and discharge does not apply to Agency Claims based on the non-delay issues referred to in Section 5.0 or on a Future Delay and the impacts thereof in the performance of the New Project Schedule.

2.4 As provided in the Contract, the Agencies' approval of the New Project Schedule shall not constitute approval or acceptance of the Contractor's means, methods, sequencing, logic, order, precedence and succession of activities or Contractor's ability to complete the Work in a timely manner. This release and discharge does not apply to, and the Contractor remains responsible for, any mistakes, errors or omissions in any schedule, including, but not limited to, mistakes, errors or omissions of logic, order, precedence, and duration, except to the extent that any such mistakes, errors or omissions arise from information provided by the Agencies and except to the extent Contractor's performance is otherwise excused under the terms of the Contract.

3.0 Amendments to Division I

Amendment Twelve to the Contract, as adopted under Section 2.1 above, amends the following sections of Division I of the Contract.

Section 3.I-11 Security of the RFC System

Section 3.I-13 System Backup and Disaster Recovery/Business Resumption Plan.

4.0 Change Orders to Division II

The Agencies and the Contractor hereby agree, without further execution, to change Sections 6.II-11.1.2.3 and 6.II-11.4 as provided in Change Order No. 13, a copy of which is attached hereto as "CCA-Attachment B".

5.0 Resolution of Deferred Issues

The Agencies and the Contractor acknowledge that issues remain concerning certain design elements. The Parties agree to cooperatively and in good faith attempt to resolve, by the end of September 2005, the "Deferred RFCS Design Issues" attached hereto as "CCA-Attachment C." In the event said issues are not resolved by September 30, 2005, either the Contractor or the Agencies may forward the issue to the DRB as a "dispute" under Section 3.I-34.

6.0 Other Terms and Conditions

6.1 The Contractor is responsible for negotiating and satisfying any and all subcontractor claims arising out of the Schedule Change on a full and final basis and shall defend, indemnify and hold harmless the Agencies from all such claims. The Agencies are responsible for negotiating and satisfying any and all claims by suppliers or other contractors of the Agencies that arise out of the Schedule Change on a full and final basis and shall defend, indemnify and hold harmless the Contractor from all such claims.

6.2 The release and discharge provided by the Contractor and the Agencies under this Agreement is each made in compromise and settlement and shall not be construed as an admission of liability.

6.3 Except as provided in Section 2.0 for Schedule Changes, nothing in this Agreement shall be construed as a waiver, release or discharge of any party's rights under the Contract or at law with regard to an other party's performance of its obligations under the Contract.

6.4 Except as expressly provided in this Agreement and its attachments, or in other executed Amendments and Change Orders, the provisions of the Contract shall remain in full force and effect without change, including but not limited to the provisions of Section 3.I-26, "Project Schedule for System Development Work", Section 3.I-27, "Progression of System Development Work", Section 3.I-33. "Contract Claims", and Section 3.I-34, "Dispute Review Board."

IN WITNESS WHEREOF, the authorized representatives of the Contractor and the Agencies have signed their names in the spaces provided below.

ERG Transit Systems (USA), Inc.

By: _____

Its: _____

Date: _____

Central Puget Sound Regional Transit Authority

By: _____

Its: _____

Date: _____

King County

By: _____

Its: _____

Date: _____

Pierce County Public Transportation Benefit Area

By: _____

Its: _____

Date: _____

Washington State Ferries, Washington State Department of Transportation

By: _____

Its: _____

Date: _____

City of Everett

By: _____

Its: _____

Date: _____

Kitsap County Public Benefit Transportation Area

By: _____

Its: _____

Date: _____

Snohomish County Public Transportation Benefit Area

By: _____

Its: _____

Date: _____

CCA- Attachment A

Amendment Twelve to the Contract for the Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System

This Amendment Twelve to the Contract for the Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System is entered into this _____ day of _____, 2005, by and between ERG Transit Systems (USA) Inc, a California corporation and wholly owned subsidiary of ERG Limited, an Australian corporation, (hereinafter referred to as the "Contractor") and each of the following seven public transportation agencies (hereinafter referred to individually as an "Agency" or collectively as the "Agencies"):

1. Central Puget Sound Regional Transit Authority ("Sound Transit")
2. King County ("King County")
3. Kitsap County Public Transportation Benefit Area ("Kitsap Transit")
4. Pierce County Public Transportation Benefit Area ("Pierce Transit")
5. Snohomish County Public Transportation Benefit Area ("Community Transit")
6. City of Everett ("Everett")
7. State of Washington, acting through the Washington State Department of Transportation, Washington State Ferries Division ("WSF")

Recitals

A. Effective April 29, 2003, each of the Agencies and the Contractor entered into Contract #229944 ("Contract") to implement a Regional Fare Coordination System ("RFC System") to establish a common fare system utilizing smart card technology. The Contractor is responsible for the development, implementation, operation and maintenance of the RFC System as specified in the Contract.

B. In order to establish a new Project Schedule and resolve potential claims and other issues, the Agencies and the Contractor have entered into that certain Contract Change Agreement dated _____, 2005. This Amendment Twelve is attached to, and adopted by, the Agencies and the Contractor as part of said Contract Change Agreement.

Amendment

NOW, THEREFORE, in consideration of the mutual covenants contained herein, the sufficiency of which is hereby acknowledged, the Agencies and the Contractor hereby agree to amend the Contract as follows:

Section 1.0 New Project Schedule

1.1 Exhibit 8, "Project Schedule," is hereby replaced in its entirety by the new Project Schedule enclosed herewith in CD format. Provided, however, the Parties acknowledge that this new Project Schedule does not necessarily reflect actual start and/or finish dates that have occurred prior to this Amendment. (Note: The Parties agree that the New Project Schedule is not available at the time of signing of this Amendment but that it will be supplied by the Contractor in a form that is consistent with the Key Completion Date Summary attached per Section 1.2 below.)

1.2 Attachment H to the Project Schedule, "Key Completion Date Summary," is hereby replaced in its entirety by the new Attachment H, attached hereto as CCA-Attachment A-1.

Section 2.0 Security Audit

Section 3.I-11, Security of RFC System," is hereby amended as follows:

3.I-11 Security of RFC System

11.1 Contractor shall maintain the security of the RFC System, including security for all computer systems, information and monetary transactions, in accordance with the professional standards of persons and firms with specialized knowledge, expertise and experience who are leading designers and providers of systems, software and hardware used in the automated smart card fare payment industry. Such security shall include, without limitation: (i) maintaining physical security of the RFC System, to ensure that no unauthorized person shall have access to the RFC System; (ii) creating firewalls, password protections, and other appropriate measures to protect against unauthorized access to the RFC System or to Customer information by Contractor's employees, Agency employees or third parties; (iii) protecting against penetration of security and manipulation of customer account data by Contractor's personnel, Agency personnel or third parties; and (iv) additional security measures as specified in the Services and Equipment Specifications in Divisions II and III.

11.2 Contractor shall update its security procedures as technology and security threats evolve to provide security capabilities at all times that are in accordance with the professional standards of persons and firms with specialized knowledge, expertise and experience who are leading designers and providers of systems, software and hardware used in the automated smart card fare payment industry.

11.3 Contractor shall have its security procedures and physical facilities audited by a qualified, nationally recognized firm, and Contractor shall take such actions as may be identified in such audit as necessary to comply with the professional standards of persons and firms with specialized knowledge, expertise and experience who are leading designers and providers of systems, software and hardware used in the automated smart card fare payment industry. The Contractor's initial security audit shall consist of the following tasks at a minimum:

- a. by September 30, 2005: a review of CDRL 31 with an assessment of its adequacy and conformance with industry best practices; a review and assessment of the Contractor's existing security measures at its facilities operating the Translink system;

b. by October 31, 2005: a detailed plan and description of the testing that will be conducted as specified in 11.3(c) below;

c. as part of the RFCS System Integration Testing (scheduled for January, 2006), intrusion and other testing activities as agreed by ERG and the Agencies.

The Contractor shall complete a second audit no later than May 31, 2006 and then shall conduct such audits by May 31 annually thereafter. Subject to the confidentiality provisions of this Contract, Contractor shall direct the auditor to provide the Contract Administrator with a copy of the final report of such audit within fifteen (15) days after it is completed.

11.4 The Contractor shall report to the Contract Administrator any unauthorized use of the RFC System or unauthorized disclosure of RFCS-related data within forty-eight (48) hours after the Contractor becomes aware of such use or disclosure. In such event, the Contractor shall take such further steps as may reasonably be requested by the Contract Administrator to prevent further unauthorized use of the RFCS or data related thereto.

11.5 At all times, the Contractor shall maintain the security of the collection and clearinghouse operations in accordance with this Contract, applicable legal and regulatory requirements, and in accordance with the professional standards of persons and firms with specialized knowledge, expertise and experience who are leading designers and providers of systems, software and hardware used in the automated smart card fare payment industry.

Section 3.0 System Backup and Disaster Recovery/Business Resumption Plan

Section 3.I-13, System Backup and Disaster Recovery/Business Resumption Plan, " is hereby amended as follows:

13.1 In accordance with the Contract Document Requirements List provided in Section 6.II-11.6.1.1, the Contractor shall submit to the Contract Administrator a comprehensive System Backup and Disaster Recovery/Business Resumption Plan. The Plan shall include, but is not limited to, the following elements:

a. A detailed explanation of protections in place at the central clearinghouse facility to protect against and mitigate the adverse impacts of power and/or communications failures, catastrophic events, or other disasters, including all on-site and remote data storage and backup procedures;

b. A detailed explanation of the Contractor's compliance with the technical specifications for data backup and recovery provided in this

Contract including, but not limited to, Sections 6.II-5.2.8 Database Management, 6.II-8.2.3 Network Management, 6.III-1.4 Data Backup and Recovery, and 6.III-3.8 FTP - Additional Security;

- c. A detailed description of the Disaster Recovery Center (DRC) which the Contractor will set up and maintain as a back-up site for the central clearinghouse facility. The DRC shall be in a location as approved by the Agencies (such approval shall not to be unreasonably withheld or delayed) and is geographically separate from, and not subject to the same risks as, the location where the clearinghouse's production equipment is regularly operated. The description shall include: (i) the location of the facility; (ii) the number of anticipated personnel to be located at the facility should its full operation become necessary; (iii) how the facility will be mobilized and operated; and (iv) a schedule and description of periodic, complete tests of readiness for such facility.
- d. A detailed description of the tools, processes and procedures required to activate the Disaster Recovery Center. All tools, processes and procedures shall be provided to the entity responsible for facility activation;
- e. Whether the Contractor plans to contract with a third party to activate and operate the Disaster Recovery Center. Such provision of services by a third party shall be subject to the approval of the Agencies, which shall not be unreasonably withheld and shall require the third party to take reasonable steps to maintain the confidentiality of all software and data; and
- f. A detailed description of procedures to be followed by the Contractor in the event that a power and/or communications failure, catastrophic event, or other disaster occurs either locally in the Puget Sound region or at the Contractor's production server_location. Such procedures shall include a description of the conditions for Disaster Recovery Center activation, and shall describe specific activation processes.

13.2 Not later than the date of commencement of the BETA Test, the Contractor shall have set up and rendered operational a facility in the Agency-approved location that is capable of replicating centralized services and data related to the operation of the RFC System.

13.3 Contractor shall notify the Contract Administrator within four (4) hours of a power and/or communications failure, catastrophic event, or other disaster.

13.4 In the event that a power and/or communications failure, catastrophic event, or other disaster prevents operations of the central clearinghouse facility and/or disrupts communications to the RFCS, the Contractor shall:

- a. Immediately and automatically place the RFCS components in off-line operation such that fare sales and collection can continue without interruption;

- b. Within twenty-four (24) hours, activate the Disaster Recovery Center and provide all RFCS on-line and off-line functionality with the exception of second tier customer service.
- c. Within twenty-four (24) hours, provide Contractor-employed staff on-site to verify correct operation of the Disaster Recovery Center. Within this period the Contractor shall also assume on-going operation of the Disaster Recovery Center until such time as the central clearinghouse and full system operation is restored; and
- d. Within thirty (30) days, restore full clearinghouse and system operation.

CCA-Attachment A-1

Attachment H Key Completion Date Summary

(to be inserted here)

CCA - Attachment B
REGIONAL FARE COORDINATION SYSTEM

CHANGE ORDER NO. 13

CONTRACTOR: ERG Transit Systems (USA) Inc.
CONTRACT NUMBER: 229944

This Change Order to Contract #229944 ("Change Order") is executed as of _____, by and between ERG Transit Systems (USA) Inc, a California corporation and wholly owned subsidiary of ERG Limited, an Australian corporation, (hereinafter referred to as the "Contractor") and each of the following seven public transportation agencies (hereinafter referred to individually as an "Agency" or collectively as the "Agencies"):

1. Central Puget Sound Regional Transit Authority ("Sound Transit")
2. King County ("King County")
3. Kitsap County Public Transportation Benefit Area ("Kitsap Transit")
4. Pierce County Public Transportation Benefit Area ("Pierce Transit")
5. Snohomish County Public Transportation Benefit Area ("Community Transit")
6. City of Everett ("Everett")
7. State of Washington, acting through the Washington State Department of Transportation, Washington State Ferries Division ("WSF")

Background

- A. Effective April 29, 2003, each of the Agencies and the Contractor entered into Contract #229944 ("Contract") to implement a Regional Fare Coordination System ("RFC System") to establish a common fare system utilizing smart card technology. The Contractor is responsible for the development, implementation, operation and maintenance of the RFC System as specified in the Contract.
- B. The Agencies and the Contractor desire to execute this Change Order No. 13 to modify the testing process provisions of the Contract to be consistent with the change to the Project Schedule of this same date.

Agreements

The Agencies and the Contractor hereby agree to the following changes to the Contract.

1.0 Implementation Planning

Section 6.II-11.1.2.3 is amended as follows:

11.1.2.3 King County Metro

The following requirements shall apply to implementation of the RFCS (including Beta Test equipment, unless otherwise indicated) at King County Metro:

- (a) The Beta Test shall consist of equipment installed at only one base, to be specified by the Contract Administrator, and must include at least one CSO to test the integration of the KCM point of sale terminal with the new system.
- (b) On-site installation of equipment shall occur during the days and times as directed by KCM, and may occur on weekdays and/or weekends (Saturdays and Sundays).
- (c) No system start-up shall occur on the day of a seasonal service schedule change which usually occurs on the first Saturday in February, last Saturday in May, and the third Saturday in September.
- (d) King County Metro will replace their existing mobile data terminal (MDT) with the driver display unit (DDU) and radio control unit (RCU) supplied under this contract.
- (e) The driver display unit and radio control unit must be operational before the on-board equipment is installed. Not later than ten (10) days after FDR NAC, the Contractor shall deliver for the Contract Administrator's approval a DDU/RCU Integration Test Plan. As stated in the Project Schedule, the Contractor shall successfully complete, on at least two buses in Seattle with King County representatives present, the agreed-upon DDU/RCU Integration Test and demonstrate that the DDU and RCU will provide the required functionality at a satisfactory level for use in County revenue service. Said DDU/RCU Integration Test shall be performed, and the report of same provided to King County, in accordance with Section 6.II-11.4.8.
- (f) Implementation of the RFCS in King County shall be coordinated with the work of other contractors and the implementation of other on-board systems. Three devices, the Driver Display Unit (DDU - Section 6.III-6), the Radio Control Unit (RCU - Section 6.8.3), and the WDOLS (Section 6.III-7) are integral to King County's on-board systems projects. These timelines are to support other projects and do not supercede equipment delivery requirements of the RFCS implementation set forth in Contract Section 6.II-11 System Implementation and the approved Project Schedule. These and other related devices shall be delivered as described below.
 - i. By March 1, 2006, five (5) production (or pre-production, if production equipment not yet available) DDUs shall be delivered to King County. These will be used by King County and designated contractors to develop other on-board system devices and applications.
 - ii. The DDU shall have the production hardware, operating system, user interfaces, and data interfaces, as well as the core application software required to operate the device, program and operate the keys and display, and create, send and receive messages to other devices. Full RCU-related functionality and the "home" screen will be provided. Full functionality of RFCS-specific application software will be provided to the extent then-available.
 - iii. DDU software and documentation shall be provided such that application and interface development can proceed on the DDU and other on-board devices (by King County or designated contractors).

- iv. By March 1, 2006, five (5) production (or pre-production, if production equipment not yet available) RCUs shall be delivered to King County. These RCUs shall have the production hardware, operating system, and data interfaces required to operate the devices. Final documentation shall be delivered.
- v. By March 1, 2006, five (5) production Wireless Data On-Off Load Systems (WDOLS - Section 6.III-7) on-board and bus antenna devices and one (1) production (or pre-production, if production equipment not yet available) Data Collection Systems (DACS - Section 6.III-12) shall be delivered to King County. These will be used to develop and test data transfer from the vehicle to the DACS. Both devices shall be supplied with the hardware, software and documentation required to conduct this development. Full functionality of RFCS and King County-specific functionality and application software will be provided to the extent then-available.
- vi. To the extent pre-production equipment must be provided to meet the above due dates, the Contractor shall provide production equipment as soon thereafter as it becomes available.

(g) As stated in the Project Schedule, final production DDUs and RCUs shall be delivered in quantities to support the RFCS Beta test. Estimated quantities for both tests are included in Appendix A.

2.0 Testing

Section 6.II-11.4 is amended as follows:

6.II-11.4 Testing Requirements

11.4.1 Overview of Testing

All of the components, subsystems and systems processes constituting the RFCS shall be tested individually and together to ensure that they meet the Contract requirements and provide a properly functioning system. The work under this section shall include all labor, materials, and support services required to completely inspect and test all hardware and software.

In addition to the qualification, integration and other internal testing it performs, Contractor shall be responsible for the performance of all of the tests described below to satisfy the objectives of each testing phase as determined by the Contract Administrator. The Agencies and/or its associates shall oversee the performance of the tests described below.

The following outlines the general testing sequence and describes the different testing stages:

(a) Factory Acceptance Tests (FAT)

Factory Acceptance Testing shall be performed to ensure that the supplied and developed components meet all functional and environmental requirements and specifications. Factory Acceptance Tests shall be performed on each type of equipment prior to it being delivered to any Agency.

For further details concerning the Factory Acceptance Tests refer to Section 11.4.2.

(b) System Integration Tests (SIT)

System Integration Testing shall be performed to verify that subsystem components, when integrated together, meet the system level functional requirements and specifications. System Integration Testing is completed prior to onsite installation of the system except as otherwise provided in Section 11.4.3.

For further details concerning the System Integration Tests refer to Section 11.4.3.

(c) Installation Test

Following onsite installation of the equipment, Installation Testing shall be performed. Installation Tests are used to determine if the equipment delivered to the installation site has been installed correctly and functions, component wise, to the requirements and specification.

For further details concerning the Installation Tests refer to Section 11.4.4.

(d) System Commissioning

During the System Commissioning testing phase the installed and integrated system is verified to function according to the system wide requirements. System Commissioning is completed prior to placing the system into revenue service, both prior to the Beta Test and prior to the Full System Acceptance Test.

For further details concerning the System Commissioning Test refer to Section 11.4.5.

(e) Beta Test

The Beta Test phase begins when a subset of each Agency's equipment is placed into revenue service. The Beta Test includes a subset of the systems and services to be provided for the full RFCS implementation. The objective of the Beta Test is to confirm the functional acceptability of the RFC systems and services under revenue service operation before implementing the full RFCS.

For further details concerning the Beta Tests refer to Section 11.4.6.

(f) Acceptance Testing

Following successful completion and Agency approval of the Beta Test, full implementation of the RFCS will proceed. Acceptance testing will be performed on all equipment and services placed into revenue service to demonstrate the performance of the system as a whole. The completion of the Acceptance Testing will be contingent upon the system meeting specified performance levels.

For further details concerning Acceptance Testing refer to Section 11.4.7.

The relationship of the specified test requirements up to completion of the Beta Test is shown in the flowchart provided in Figure II-11.4.

The relationship of the specified test requirements up to completion of the Full RFCS Implementation is shown in the flowchart provided in Figure II-11.5.

Figure II-11.4
Relationship Of Phase I Testing (Beta Test)

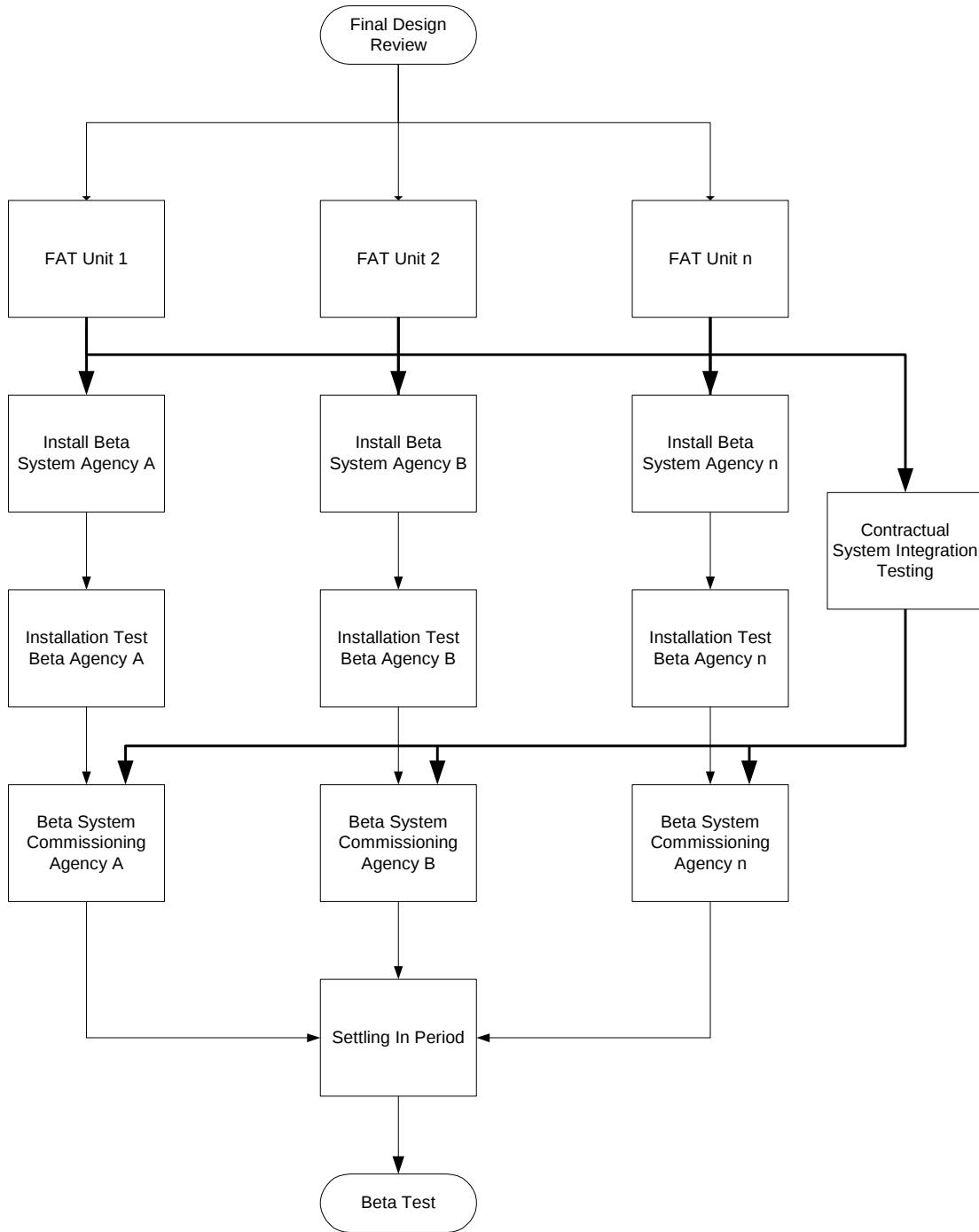
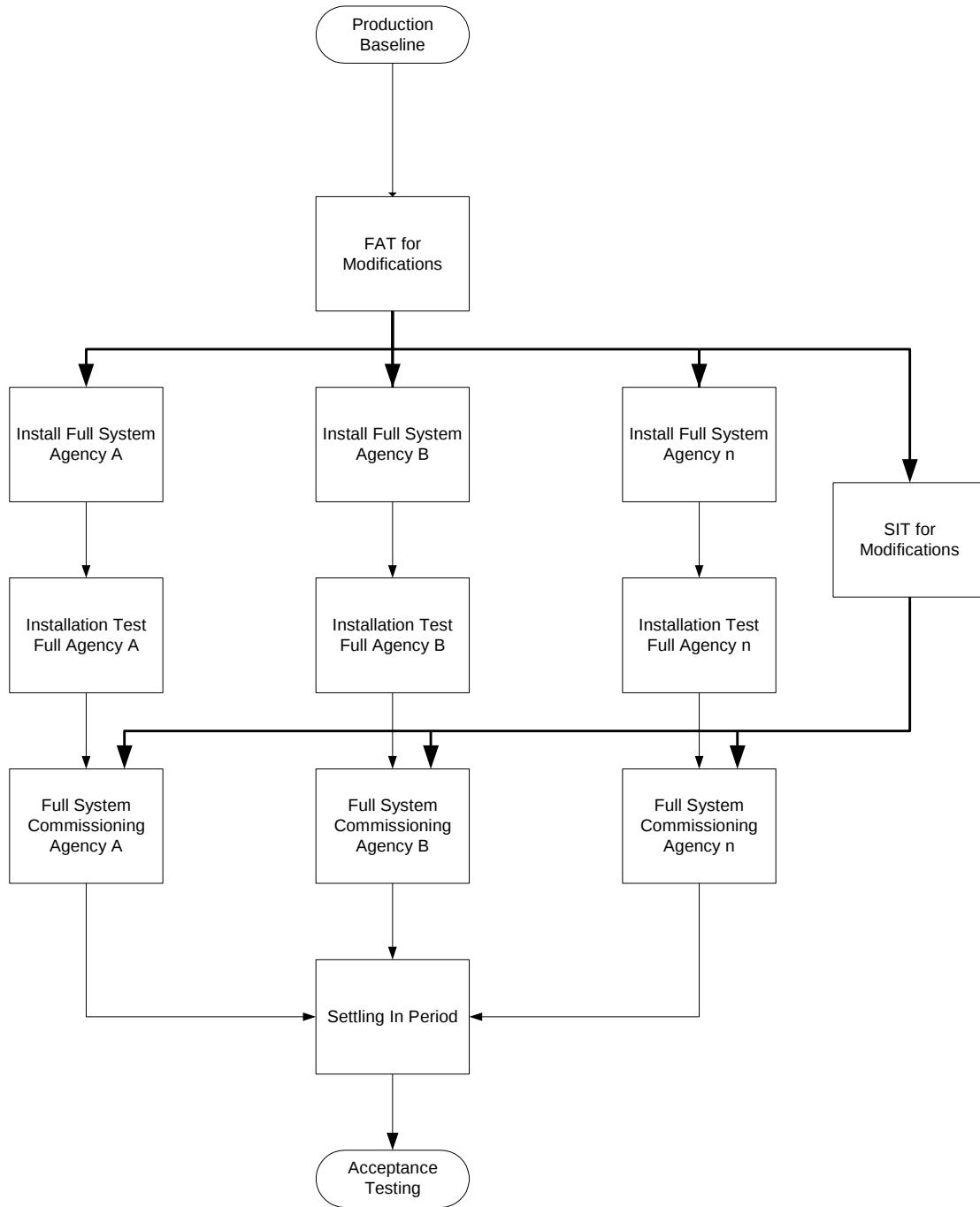


Figure II-11.5
Relationship Of Phase II Testing
(Full RFCS Implementation)



11.4.2 Factory Acceptance Tests (FAT)

The Contractor shall provide a comprehensive Factory Acceptance Test (FAT) program (CDRL 14) that shall consist of the following individual test programs:

- i. Functional Test
- ii. Environmental Test
- iii. Electromagnetic Interference Test

iv. Radiated Electromagnetic

v. Human Factors Test

(a) Each equipment type and all of its functions shall be subject to the FAT unless waived by the Contract Administrator.

(b) One item of each equipment type shall be tested as specified in this Section 11.4.2 and the accepted Factory Acceptance Test Plan (CDRL 14).

(c) If the Contractor can prove by certification of using authority, property, or independent testing organization that equipment manifestly similar to that specified here has been subjected to testing to the extent specified, the associated test may be waived, subject to the Contract Administrator's approval. The Contractor shall submit independently verified tests to the Contract Administrator for approval at least sixty (60) days prior to the scheduled start date for the FAT. Whether a test is completed or waived by the Contract Administrator, the Contractor agrees, as also provided in Section 3.I-7, that it retains full responsibility to deliver System equipment and functions that comply with the Contract requirements.

(d) Factory Acceptance Testing shall be performed in controlled, laboratory conditions at a Contract Administrator approved factory or independent facilities.

11.4.2.1 Functional Test

The purpose of this test shall be to demonstrate that for each RFCS equipment type, the functions specified throughout the Contract Documents, including all limiting conditions, shall be met.

(a) The equipment shall be required to execute all hardware and software functions as detailed in these specifications and to meet the performance criteria requirements.

(b) The Contractor shall be responsible for developing a functional test procedure that satisfactorily demonstrates all equipment functions and shall submit this test procedure to the Contract Administrator for approval thirty (30) days in advance of the test.

(c) Each function specified shall be tested at least once prior to confirming success or failure. Each equipment type shall have passed a full hardware diagnostic test before the environmental tests are started.

11.4.2.2 Environmental Test

Environmental tests shall be performed one (1) time per on-board and outdoor equipment and shall be tested per SAE Recommended Practice J1455 JAN88, as follows:

(a) Test 1 The Thermal Shock Test shall be per Section 4.1.3.2 of the aforementioned SAE Recommended Practice, and shall use the thermal profile portrayed in Figure 2C of said section, except that:

i. The storage temperature limits shall be 25 to +150 degrees Fahrenheit.

- ii. The presoak shall be 2 hours at 25 degrees Fahrenheit.
- iii. Hour 24 to hour 25 shall be at 70 degrees Fahrenheit.

Functional tests shall occur immediately prior to and after the 25 hour test period.

- (b) Test 2 The Thermal Cycle Test shall be per Section 4.1.3.1 of the aforementioned SAE Recommended Practice, and shall use the thermal profile portrayed in Figure 2B of said section, except that:
 - i. The temperature limits shall be 10 to +135 degrees Fahrenheit.
 - ii. The chamber temperature shall be held for two (2) hours minimum at the 10 degrees Fahrenheit, followed by two (2) hours minimum at +135 degrees Fahrenheit, followed by two (2) hours minimum at +70 degrees Fahrenheit.
 - iii. Tests shall occur immediately prior to and every thirty (30) minutes during the test period, which will terminate at eight (8) hours minimum, provided that all conditions above are satisfied.
- (c) Test 3 The Humidity Test shall be per Section 4.2.3 of the aforementioned SAE Recommended Practice, and shall use the humidity profile portrayed in Figure 3A, Recommended Humidity 8 Hour Cycle, of said section, except that:
 - i. Temperature limits shall be 10 to +135 degrees Fahrenheit.
 - ii. Humidity shall be 95% relative humidity (non-condensing).
- (d) Test 4 The Waterfront Test shall be conducted per an approved Waterfront Testing Plan to be prepared by the Contractor. No guidelines/standards currently exist for the testing of equipment to be used in an outdoor marine environment, such as that of the WSF. The Contractor shall prepare a comprehensive test plan, designed to demonstrate the operability of the equipment in the WSF environment, to be conducted at the WSF docks. This Test Plan shall be subject to the approval of the Contract Administrator and WSF.

11.4.2.3 Electromagnetic Testing

- (a) Equipment shall be tested for electromagnetic compatibility per Section 6.III-1.7.1.
- (b) Equipment shall not sustain any permanent damage as a result of the exposure to electromagnetic fields nor shall it lose any data.
- (c) Testing shall take into account the conditions existing at Agency facilities including the radar emissions and radio transmissions from WSF ferry operations, as well as bus tunnel and trolley conditions.

11.4.2.4 Radiated Electromagnetic Energy Test

The Contractor shall identify requirements and demonstrate compliance with applicable Federal Communication Commission (FCC) regulations concerning conducted and radiated radio frequency energy.

11.4.2.5 Human Factors Test

The human factors test shall verify that features and operating characteristics affecting the use of the RFCS by customers and Agency personnel are easy to understand, easy to use, and quick in response to customer and Agency personnel actions. The test shall be designed to evaluate items such as the following:

- (a) Time to perform a transaction.
- (b) Time to reset the device.
- (c) Time initialize the device from a complete power down.
- (d) Time to switch between various operating modes.
- (e) ADA compliance with regard to customer operation controls and instructions. The Contractor will provide a written statement prior to completion of Factory Acceptance Testing describing how the devices have been designed to comply with the ADA regulations and guidelines.

11.4.3 Systems Integration Test

The goal of Systems Integration testing is to connect each RFCS Subsystem and demonstrate the functionality as a fully integrated system prior to on site installation.

11.4.3.1 System Integration Test Plan

Contractor shall develop a System Integration Test Plan (CDRL 16) identifying how each subsystem is integrated such as communications, protocols, and data relationships, including any boundary conditions and security provisions. The Test Plan shall describe procedures to be followed for demonstrating the following, at a minimum:

- (a) Alarm transmission and all other device/component monitoring functions.
- (b) Data transmission, including all control functions, between devices and the DACS.
- (c) Data transmission between devices, DACS and Clearinghouse System.
- (d) Data integrity and security.
- (e) Credit and debit card transaction approvals and rejections (all types).
- (f) Check transaction approvals and rejections.
- (g) Funds reconciliation and settlement.
- (h) Report generation and transmission to Agencies.
- (i) Bad card rejections and lockout.
- (j) Auto revalue of cards.
- (k) Operating ranges for each type of equipment.

- (l) Performance measures.
- (m) Data encryption/security provisions for each type of data transfer.
- (n) All data transmissions shall be inspected for accuracy. Inaccurate data transmissions shall be recorded as a failure of the particular test for which the transmission was performed.
 - (o) End-to-end scenario testing and business rule testing as specified in the accepted System Integration Test Plan (CDRL 16).
 - (p) The procedures for handling maintenance (troubleshooting and correcting faults) and service functions shall also be written and demonstrated.
 - (q) ADA compliance with regard to customer operation controls and instructions.
 - (r) Facilitation of transit operator-customer interaction as a human factor.
- (s) The System Integration Test Plan shall also describe procedures for the Contractor to conduct a maintainability test that consists of introducing faults into the equipment and systems, and then measuring the time required for a technician to correct the fault.
 - i) The Maintainability Test Plan (CDRL 15) shall show the basis of sample size selection and list of faults, including a reasonable time limit for repair performed by an average technician based on field experience, to be introduced into the equipment. This list shall represent every known failure mode for each unit of equipment and system, next to each fault, the Contractor shall identify.
 - ii) The maintainability test shall be conducted in the following steps:
 - a. The Contractor shall provide several units of the equipment to the Contract Administrator to simulate failed components, mis-adjustments, and incorrect settings.
 - b. The simulated failures shall be introduced in proportion to their expected failure rate.
 - c. The Contractor's maintenance personnel shall be unaware of the simulated failures and shall be assigned to troubleshoot the equipment.
 - d. The repair times shall be recorded and the mean-time-to-repair (MTTR) shall be compared with the advance list provided by the Contractor.
 - iii) Maintainability Test results shall be reviewed and approved by the Contract Administrator.

The System Integration Test Plan, including the Maintainability Test Plan, shall be submitted for the approval of the Contract Administrator a minimum of ninety (90) days prior to the commencement of System Integration Testing.

11.4.3.2 System Integration Test Bed

- a. The Contractor shall provide a test-bed located in the Puget Sound Area. Each Agency equipment configuration shall be assembled in a single test-bed ("RFCS

test-bed") to permit interconnection to simulate the overall RFCS. The RFCS test-bed shall be used to perform, among other things, device interface and integration testing, including systems integration.

It is not required that the Central System or DACS which support financial and operational data processing be collocated at this site, but it must be possible to interconnect the test-bed equipment to them using the telecommunications processes to be used in the installed system environment.

b. The test-bed shall be established prior to the commencement of System Integration Testing. Each Agency's actual equipment shall also be utilized in the RFCS test-bed to perform end-to-end testing prior to delivery of said Agency equipment to Agency facilities.

c. The Contractor shall be responsible for the test-bed environment until completion of Contract.

The test-bed shall remain operational through the duration of the Contract and shall be supported by the Contractor and updated to reflect any changes to the devices, software and/or system configuration.

11.4.4 Installation Test

Installation Test shall occur any time a new unit of equipment is added on the site or an existing installed unit is exchanged.

Upon verification of proper installation of the equipment, Contractor shall perform a complete post-installation operational test.

(a) All functions of installed equipment at each location shall be tested under the supervision of Agency representative(s) to ensure operation of the equipment as specified.

(b) An Installation Test Plan shall be submitted to the Contract Administrator a minimum of sixty (60) days prior to scheduled Installation Testing, and shall be subject to the approval of the Contract Administrator.

(c) The Contractor shall inform the Contract Administrator, in writing, of any failures during Installation Testing.

(d) The Contractor shall notify the affected Agency a minimum of seventy-two (72) hours, excluding weekends and holidays, prior to the scheduling of any Installation Tests at a particular site, and will not conduct any testing without RFCS and relevant Agency representation.

(e) On thirty-five (35) days prior notice from the Contract Administrator, the Contractor shall provide, on site at Community Transit, a qualified software engineer to test and complete the integration of the DDU application described in 6.III-6.8.4.

11.4.5 System Commissioning

Upon completion of Installation Testing, prior to the Beta Test and prior to Full-System Acceptance Testing, all system interfaces and integration functions shall be tested by the Contractor to verify proper operation of the installed RFCS as a whole:

- (a) The Contractor shall develop a System Commissioning Plan (CDRL 17) to demonstrate that all systems are fully operational prior to entering revenue service.
- (b) The System Commissioning Plan shall identify and describe all necessary tests to verify proper interfacing and installation of the equipment with other system facilities, including at a minimum:
 - i. Schedule for system commissioning.
 - ii. Commissioning test period.
 - iii. Procedures for collecting and verifying data from each type of equipment.
 - iv. Procedures for verifying the correct transfer of control commands to each type of equipment.
 - v. Test reports content to be prepared.
- (c) The System Commissioning Plan shall be submitted to the Contract Administrator a minimum of ninety (90) days prior to scheduled System Commissioning Test, and shall be subject to the approval of the Contract Administrator.
- (d) The Contractor shall inform the Contract Administrator, in writing, of any failures during System Commissioning Testing.
- (e) The Contractor shall notify the affected Agency a minimum of seventy-two (72) hours, excluding weekends and holidays, prior to the scheduling of any System Commissioning Tests at a particular site, and will not conduct any testing without RFCS and relevant Agency representation.
- (f) System Commissioning Testing, as described herein and as specified by RFCS, shall be performed at the Agencies facilities.

11.4.6 Beta Test

The RFCS Beta Test shall demonstrate the same level of system functionality and the services to be provided for full RFCS rollout, and involving Agency personnel just as the full system would require, only on a smaller scale. The Beta Test shall involve the exercise of the small scale system under revenue service conditions. All functional requirements of the RFC system shall be tested. The estimated equipment quantities for each Agency for the Beta Test are listed in Appendix A.

11.4.6.1 Beta Test Objectives

The primary objectives of the Beta Test shall be to:

- (a) Validate that the system meets the functional, operational, and technical specifications of the fare card program as defined in the RFP under revenue operations.

(b) Ensure that the fare card technology, system design and implementation meet the internal needs of the individual Agencies in the Region for AFC systems and services, including any specific requirements or constraints with respect to physical implementation or operational processes.

(c) Provide an assessment of, and field experience with, equipment reliability and maintenance requirements.

(d) Provide an overall assessment of the program cost effectiveness and fiscal impact for each Agency.

(e) Determine the appropriate scope of full rollout based upon the outcomes of Beta Test evaluation.

11.4.6.2 Beta Test Settling In Period

The initial period following commencement of revenue service in the Beta Test stage will be known as the Beta Test Settling In period. This period will provide a short time for the Contractor and the Agencies to correct minor implementation errors in advance of Beta Testing. The Beta Test Settling In period will consist of a minimum of ten (10) days.

11.4.6.3 Changes to Agency Business Processes

(a) The Contractor shall provide information to each Agency regarding each aspect of Beta test implementation, operation, and evaluation that impacts existing Agency operations. This information will be used by each Agency to update their business practices. At a minimum, impacts and required changes shall be identified in the areas of:

- i. Customer service
- ii. Revenue management and reporting
- iii. Ridership data management
- iv. Training
- v. Equipment installation
- vi. Equipment operation
- vii. Equipment testing and maintenance
- viii. Computer and network operations
- ix. Inventory and fare media management
- x. Public transportation operations
- xi. Marketing

(b) Changes required to existing Agency business practices shall be identified a minimum sixty (60) days prior to the scheduled start of the Beta test.

11.4.6.4 Test Equipment, Documentation and Training

All test equipment, documentation and training required for the Beta test shall be provided by the Contractor a minimum sixty (60) days prior to the scheduled start of the Beta test.

11.4.6.5 Beta Test Plan

- (a) The Contractor shall prepare and submit a Beta Test Plan (CDRL 18) to the Contract Administrator for review and approval a minimum of ninety (90) days prior to the scheduled start of the Beta test.
- (b) At a minimum, the Beta Test Plan shall include:
 - i. Schedule of all development, installation testing and implementation activities.
 - ii. Description of proposed tests, procedures, recording methods, and test equipment per Section 6.II-11.4.8. Included in this shall be a series of control tests where specific transactions can be traced end-to-end through the system.
 - iii. Contractor recommendations of fare cards and infrastructure elements required to meet the objectives of the Beta test.
 - iv. Agency training and documentation.
- (c) The Agencies reserves the right to make changes to the Beta Test Plan as required and deemed necessary to meet and evaluate Beta test objectives.
- (d) The final Beta test infrastructure is subject to approval and confirmation by the Agencies.

11.4.6.6 Certification of Beta Test Readiness

Prior to beginning the Beta Test, the Contractor shall submit a Certification of Beta Test Readiness (CDRL 19) to the Contract Administrator. At a minimum, the Certification of Beta Test Readiness shall certify that:

- (a) The Contractor has completed and the Contract Administrator has accepted the Beta Test Plan and all related procedures;
- (b) The Contractor has submitted and the Contract Administrator has accepted all deliverables required to be submitted prior to conducting the Beta Test;
- (c) The Contractor has submitted and the Contract Administrator has accepted all required intellectual property documentation;
- (d) The Contractor has provided all training required to be conducted prior to beginning the Beta Test;
- (e) The Contractor has satisfied all applicable pre-test conditions imposed by this Contract or the accepted Beta Test Plan;
- (f) The Contractor has completed all applicable software coding;

- (g) The Contractor has completed installation of all equipment to be used in the Beta Test;
- (h) All required systems are integrated, on-line, and ready for use;
- (i) The Contractor will conduct the Beta Test in complete conformity with the Beta Test Plan and the Contractor is aware of no matters which will adversely affect its ability to do so;
- (j) The Contractor is ready to begin the Beta Test immediately.

The Contractor shall not commence the Beta Test until the Contract Administrator has issued a Notice of Apparent Completion for the Beta Test Readiness Milestone per Section 3.I-27.6. The Contractor shall promptly provide any documentation or information requested by the Contract Administrator to assist in the Contract Administrator's review of the Certification or the Contractor's state of readiness.

11.4.7 Acceptance Test

Acceptance testing shall be performed at a system level after the start of revenue service, with all components and subsystems completely functional, operational, on-line, and in service.

- (a) Acceptance testing shall be conducted by the Contractor in cooperation with Agency personnel and shall be subject to review and approval by the Agencies.
- (b) The RFCS will be installed in phases, acceptance testing of the equipment may also be conducted in phases.
- (c) Contractor may choose to group installed and commissioned equipment by Agency, by groups of Agencies, by equipment type across the entire system, according to start-up date, or other grouping approved by the Contract Administrator for acceptance testing purposes.
- (d) Reliability calculations for a particular equipment type in a group will remain consistent throughout the acceptance testing period.
- (e) Grouping of devices for Acceptance Testing shall be described in detail in Contractor's Acceptance Testing Plan and shall be subject to Contract Administrator approval.
- (f) The Agencies reserve the right to make changes to the Acceptance Testing Plan to demonstrate conformance with the Contract requirements.
- (g) Acceptance requirements for equipment installed for WSF will be determined at the time of Implementation.

11.4.7.1 Acceptance Testing Settling In Period

The initial period of time following the completion of Phase II installation shall be designated as the Acceptance Testing Settling In period.

- (a) The Acceptance Testing Settling In period will last for at least thirty (30) days of revenue service prior to beginning Acceptance Testing.

- (b) During the Acceptance Testing Settling In period a failure review test process shall be established (CDRL 20) by the Failure Review Team.
- (c) At the end of the Acceptance Testing Settling In period the Mean Transactions Between Failures (MTBF) for high transaction volume equipment of the same type shall be not less than 40% of the MTBFs presented in Division III for each type of RFCS equipment.
- (d) For equipment of the same type in a low transaction volume environment, the mean operating hours between failures (MOHBF) in a group shall be not less than 40% of the mean hours between failures presented in Division III for each type of RFCS equipment.
- (e) If at the end of the Acceptance Testing Settling In period the above MTBF and mean operating hours between failures (MOHBF) criteria are not met, then the reliability of the equipment shall be monitored until these criteria are met for thirty (30) consecutive days.
- (f) Acceptance testing shall not commence until the MTBF and MOHBF requirements in (c) and (d) above are met.

11.4.7.2 Acceptance Test Plan

Contractor shall develop a Acceptance Testing Plan (CDRL 21).

- (a) The plan shall be a comprehensive and detailed document, describing the management, monitoring, recording, and reporting procedures that will govern the acceptance testing period.
- (b) The Acceptance Testing Plan shall be submitted to the Contract Administrator for review and approval a minimum of ninety (90) days prior to the scheduled start of the Acceptance Test period.
- (c) The Agencies reserve the right to make changes to the Acceptance Testing Plan to demonstrate conformance with the Contract requirements.

11.4.7.3 Acceptance Test Requirements

At the end of the settling period, Acceptance Testing shall begin and shall be conducted over a minimum of one hundred and eighty (180) days under revenue service conditions.

- (a) The acceptance testing shall be conducted in three performance periods related to the reliability of the system. The MTBF and MOHBF requirements during the acceptance testing shall be incrementally increased from the settling period values in sixty (60) consecutive day periods as follows:
 - i. **0-60 days:** 60% of the MTBF and mean hours of operation between failures specified in Division III for each type of RFCS equipment.
 - ii. **61-120 days:** 80% of the MTBF and mean hours of operation between failures specified in Division III for each type of RFCS equipment.
 - iii. **121-180 days:** 100% of the MTBF and mean hours of operation between failures specified in Division III for each type of RFCS equipment.

- (b) Each subsequent acceptance testing period shall not commence until the all requirements specified for the previous period of testing have been met.
- (c) During the Acceptance Testing period, chargeable failures shall be identified and recorded per Section 6.III-1.5.3.
- (d) Within fifteen (15) days following the completion of each period of Acceptance Testing, Contractor shall provide all testing data, documentation, reports, and all other related information to the Contract Administrator.
- (e) For any single group, if after sixty (60) consecutive days, the MTBF and MOHBF for that period has not been met, the acceptance testing shall continue beyond the sixty (60) consecutive days until the equipment has achieved the applicable reliability requirement.
- (f) Under no circumstances shall the acceptance testing for any group be allowed to proceed to the next sixty (60) consecutive day test period until the previous criteria has been met by that group.
- (g) For each group, the MTBF for high transaction volume devices for a given sixty (60) consecutive day period shall be derived by summing all the transactions for the sixty (60) consecutive day period for that group and device type and dividing by the number of chargeable failures recorded during that period for that group and device type.
- (h) If for any reason, a test period is not comprised of sixty (60) consecutive days, then the average MTBF shall be calculated by summing the transactions and chargeable failures for each individual test period, totaling not less than sixty (60) days of test data.
- (i) Should the equipment fail to meet the performance requirements as specified herein, Contractor shall make whatever improvements to the equipment and/or systems which are needed to meet the requirements.
- (j) Contractor shall continue to improve RFCS equipment and systems until the Contract requirements are met.
- (k) The Agencies reserve the right to limit the cut-over of the installed equipment if the acceptance test requirements are not being met.

11.4.8 General Testing Procedures and Definitions

11.4.8.1 General Procedures

For each inspection and test, the Contractor shall:

- (a) Prior to testing or inspection, submit a detailed Test Procedure to the Contract Administrator for review and approval (CDRL 22) a minimum of thirty (30) days prior to conducting the test.
- (b) Provide check-off sheets for the items to be inspected, measurements to be taken, features required to be present, and the criteria required to be met.

- (c) Be responsible for all Contractor, Supplier and Subcontractor inspections and tests to be performed, including those performed under the Contractor's Quality Assurance plan.
- (d) Any and all hardware and software not passing inspections and/or tests and not meeting the approval of the Contract Administrator shall be repaired, replaced, and/or corrected by the Contractor and rescheduled for inspection and testing.
- (e) Receive approval from the Contract Administrator prior to proceeding with any tests or inspections.
- (f) Submit the final report to the Contract Administrator for review within thirty (30) days after completion of the inspection or test.
- (g) Retain all inspection and test results for a period of not less than two (2) years, during which the results shall be available for Agency review.
- (h) The Agencies reserve the right, at their discretion, to witness any or all inspections/tests, using Agency personnel and/or Consultants and agents.
- (i) In addition, the Agencies reserve the right to develop additional test procedures to be performed by the Contractor or other designated organizations.
- (j) The Contractor shall pay all Contractor-incurred travel, accommodation and living costs for the witnessing of inspections and tests.

11.4.8.2 Test Plan

The Contractor shall prepare a test plan and applicable procedures, that shall govern the conduct of activity, surveillance, direction, and methods of observing and recording the pertinent data. The Contractor shall provide an Overall Inspection and Test Plan (CDRL 23) and specific Test Plans for each specific test. The Contract Administrator shall approve the test plan prior to proceeding with testing. As a minimum, the following elements shall be included in the test plan:

- (a) Dates, times and locations of testing.
- (b) Support and calibration tools and instrumentation to be used.
- (c) Technical publications to be referenced.
- (d) Spares and consumables to be available.
- (e) Maintenance facilities needed.
- (f) Staffing requirements to be met.
- (g) Scheduling of personnel.
- (h) The format and specific data to be collected during the test period together with the method used to report the test results.
- (i) Preventive maintenance tasks to be performed during the test.

11.4.8.3 Test Procedure Outline

The test procedure shall include, as a minimum, the following:

- (a) Objective of test.
- (b) Test environmental conditions.
- (c) Detailed description of test specimens including drawings, part numbers, inspection and test records, maintenance records, and calibration records.
- (d) Detailed procedure of test.
- (e) Test equipment to be used, including any measuring equipment and/or any equipment aiding in the performance of the tests.
- (f) The level and schedule of preventive maintenance during the test.
- (g) Pass/fail criteria.
- (h) Retest procedure.
- (i) Test data sheet format.
- (j) Test notification to engineer.
- (k) Test reports.

11.4.8.4 Test Tools and Logging

At a minimum, the Contractor shall maintain the following capabilities:

- (a) Automated tools for measuring and capturing data packets and data flows at each major interface, from end to end, between subsystems. The test tools may include standard off the shelf communications software or customized in house trace and logging software. In the design review, the contractor shall propose a suite of tools and describe the methodologies for use.
- (b) Automated test tools shall be thoroughly documented in their use.
- (c) The test plan and procedures shall include the ability to automatically identify points of data corruption or transmission failure.
- (d) The reporting of test data must be made in English, and provide the ability to sort by time, event type and other key attributes, so that an end to end verification of data flows can be readily obtained.
- (e) Event log messages shall be logically grouped and labeled, fully parsed, and loaded into a database in a production manner, so that they are readily available for troubleshooting and analysis.

11.4.8.5 Test Reporting

The Contractor shall provide a complete report documenting the operation and reliability during all acceptance testing. The report shall be in a form acceptable to the Contract Administrator. Test Reports are contract deliverables under CDRL 24.

11.4.8.6 Test Failure Resolution

The test procedures shall describe the process to be followed for the resolution of test problems, failure recurrence control, and general test conduct ground rules.

11.4.8.7 Type I and Type II Failures

11.4.8.7.1 Type I Failures

A Type I failure is a malfunction resulting from conditions beyond the control of the Contractor, or failures that are minor in nature and quickly corrected. Type I failures may include:

- i. Power or communications outage.
- ii. “Jams” of mechanical equipment.
- iii. Accidents or mishandling.
- iv. Localized equipment failures.
- v. Test facility or instrument failure.

The following shall apply to Type I failures:

- (a) Unless otherwise approved by the Contract Administrator, the test period shall be suspended for the time necessary to make the corrections, and testing shall resume starting at the time testing was suspended.
- (b) Time suspension shall begin when the failure is first noticed, and it shall extend only as long as required to correct the failure.
- (c) If a second Type I failure occurs in the same device, the Contractor shall provide evidence that the failures were distinct and unrelated in order to be classified as Type I. Final determination shall be made by the Failure Review Team per Section 6.III-1.5.3.

11.4.8.7.2 Type II Failures

A Type II failure is a malfunction that involves conditions within the control of the Contractor, failures related to the system design, or failures that may be of a minor or major nature that cannot be easily and quickly corrected. Type II failures include, but are not limited to:

- i. Two of the same Type I failures that occur after the first Type I failure has been corrected.
- ii. Three or more Type I failures (related or unrelated) in the same device.
- iii. Design deficiencies.
- iv. Software or firmware problems or recompilations.
- v. Failure to meet performance requirements.

Unless otherwise approved by the Contract Administrator, the test period shall be restarted to time zero after corrections are made.

3.0 Other Terms and Conditions

3.1 The Contractor waives and releases any and all claims arising out of, or related to, this Change Order, and all work and actual or constructive changes that occurred or began prior to the date of this Change Order, including, but not limited to, claims for equitable adjustment of time and compensation, delay, impact, overhead, or inefficiencies.

3.2 Except as expressly amended by this Change Order, the Contract remains in full force and effect. All other provisions of the Contract not referenced in this Change Order No. 13 shall remain in effect unless modified in other executed Amendments and Change Orders.

CCA – Attachment C

Deferred RFCS Design Issues

Regional Fare Coordination Project				
Contract Change				
Agreement: Deferred Design				
Address in September 2005:				
Final System				
Updated:	8/24/2005			
Category	Design Issue No	RFI	RFI Name	Problem Statement
Equipment				
CST	186			ERG to describe how card printing will work using existing photo files.
CST		RFCS 131	Low-Tech Portable CST	Portable CST employing a less sophisticated technical solution.
CST		RFCS 136	CST - Electronic Check Readers	CST check reader
On-Board FTP		ERG 263	OBFTP Memory Expansion	Additional memory for the On-Board Fare Transaction Processor.
Portable FTP		RFCS 110	WSF Handheld Device	ERG was requested to explore providing a single application for the Portable Fare Transaction Processor (P-FTP) for Washington State Ferries (WSF). This functionality would include a barcode reader.
TRU		RFCS 135	TRU Configuration	TRU configuration with internet communication solution
TVM	DR 107	DR 107	TVM Integration	DR 107 TVM Integration is not complete
ACCESS				
Non-PFTP Solution	660			KCM to prepare an RFI regarding process for providing RFCS information on rides on ACCESS paid for with regional or Institutional passes.
Non-PFTP Solution		RFCS 114	KCM ACCESS - card-not-present	To describe how KCM ACCESS fare collection shall operate in a card-not-present environment.
Non-PFTP Solution		RFCS 115	KCM ACCESS - ridership data	To describe how KCM ACCESS ridership reporting shall be performed
Vanpool				
Institutional Agreements		ERG 216	Institutional Agreements & Vanpools	Addresses how institutional agreements handle vanpool fare payment.
Non-PFTP Solution	667			ERG to investigate retail side of vanpool for CD.
Non-PFTP Solution	670			Agencies to determine how to prevent double-dipping for vanpools in non-PFTP environment.
Non-PFTP Solution	138			Need to finalize back-office integration & reporting for non-PFTP vans. Agencies to review ERG's recommendations.
Institutional Cards				
Agency Operator Cards		RFCS 137	Agency Operator Cards and Institutional Programs	Describes how agencies will take advantage of the Institutional Program features of the system for their own employees & system operators.
ACCESS Passes		RFCS 140	Institutions and ACCESS passes	Pertains to an Institutions' ability to offer ACCESS passes within their subsidy programs
KT Low-Income Riders		RFCS 144	Institutional Cards & KT Low-Income Riders	Requests description for how KT Low Income card holders will participate in an Institutional Program.
Operator Cards				

Operator Cards		ERG 246	Operator Cards	Describes the functionality required for the agencies to produce and manage Operator Cards, including costs (by option) and hardware requirements.
Operator Cards		RFCS 132	Assignment of additional operator roles	Within this RFI ERG has proposed a solution for meeting the requirement for assigning additional operator roles within the system.
Website				
Institutional Program		ERG 268	KCM Institutional Program MOR	ERG has not yet fully analyzed the impact of providing this functionality and would like to address post-FDR. Also ERG requests that all agencies agree that each Lead Agency will remain as Merchant Of Record regardless of payment mechanism.
Card Registration		RFCS 122	Security & On-Line Registration	The agencies request that ERG investigate alternative solutions for providing card registration (e.g., linking) via the RFCS web site that will not compromise system security
Other				
Payment Methods		ERG 260	Commuter Bonus Vouchers	Commuter Bonus Vouchers as a specific payment method
Claims Processing	8	RFCS 077	Automation of Claims Reporting process	Need to provide impacts related to automating the claims process.
Full Integration Mode		RFCS 126	KCM FIM	Need to address how conversion from LIM to FIM will occur on KCM fleet.